

CLAIMS

1. A terminal device that obtains, from a server device, a license for using a content based on transaction processes and controls use of the content based on the license, each of the transaction
5 processes including sending of a request message, receiving of a response message, and sending of a commit message for finalizing completion of one transaction, said terminal device comprising:
 - a holding unit operable to hold a 1-bit transaction identification flag indicating whether a current transaction process
10 is in progress or completed; and
 - a sending unit operable to send the transaction identification bit instead of a commit message when sending a second or later request message, without sending a commit message in each transaction process except for a last transaction process in
15 successive transaction processes.
2. The terminal device according to Claim 1, comprising:
 - a response receiving unit operable to receive each response message sent from the server device in the transaction processes;
20 and
 - an update unit operable to update the transaction identification flag held by said holding unit according to each reception result of said response receiving unit.
- 25 3. The terminal device according to Claim 2,
 - wherein said update unit is operable to set a same value as a value of a transaction identification flag held by the server device as an initial value of the transaction identification flag held by said holding unit, and to invert a value of the transaction identification
30 flag held by said holding unit when a response message is received by said response receiving unit.

4. The terminal device according to Claim 3,
wherein the initial value of the transaction identification flag
is included in a first response message sent from the server device
in the transaction processes, and

5 said update unit is operable to set the transaction
identification flag held by said holding unit to the initial value when
said response receiving unit receives the first response message,
and to invert the value of the transaction identification flag held by
said holding unit when a response message is normally received by
10 said response receiving unit.

5. The terminal device according to Claim 3,
wherein said sending unit includes:

a request sending unit operable to send the transaction
15 identification bit instead of sending a commit message when
sending the second or later request message in the transaction
processes; and

a commit sending unit operable to send the commit message
only in the last transaction process in the transaction processes.

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6. The terminal device according to Claim 5,
wherein said request sending unit is operable to send the
transaction identification bit inverted by said update unit, together
with a request message for a next transaction process, in the case
25 where a response message is normally received by said response
receiving unit.

7. The terminal device according to Claim 6,
wherein said request sending unit is operable to send again
30 the transaction identification bit that is not inverted, together with a
request message for the current transaction process, in the case
where a response message is not normally received by said response

receiving unit.

8. The terminal device according to Claim 2,

wherein said terminal device performs processing for mutual authentication with the server device immediately before a first transaction process in the transaction processes, and further comprises:

an authentication unit operable to:

provide said sending unit with first authentication information as an authentication request, the first authentication information being used by the server device to authenticate said terminal device;

verify second authentication information that is received by said response receiving unit as a response to the first authentication information, the second authentication information being used by said terminal device to authenticate the server device; and

provide said sending unit with a finalization message for finalizing the mutual authentication according to a result of the verification,

wherein said sending unit is operable to send the finalization message together with a request message for the first transaction process.

9. The terminal device according to Claim 8,

wherein the transaction processes are performed on a session that is same as a session on which the mutual authentication has been performed.

10. The terminal device according to Claim 8,

wherein said update unit is operable to set a same value as a value of a transaction identification flag held by the server device as an initial value of the transaction identification flag held by said

holding unit, and to invert a value of the transaction identification flag held by said holding unit when a response message is received by said response receiving unit.

- 5 11. The terminal device according to Claim 10,
 wherein said sending unit includes:
 a request sending unit operable to send the transaction
 identification bit instead of sending a commit message when
 sending the second or later request message in the transaction
10 processes; and
 a commit sending unit operable to send the commit message
 only in the last transaction process in the transaction processes.
- 15 12. The terminal device according to Claim 11,
 wherein said request sending unit is operable to send the
 transaction identification bit inverted by said update unit, together
 with a request message for a next transaction process, in the case
 where a response message is normally received by said response
 receiving unit.
- 20 13. The terminal device according to Claim 1,
 wherein said request sending unit is operable to send again
 the transaction identification bit that is not inverted, together with a
 request message for the current transaction process, in the case
25 where a response message is not normally received by said response
 receiving unit.
- 30 14. A server device that provides a terminal device with a license
 for using a content based on transaction processes, each including
 receiving of a request message, sending of a response message, and
 receiving of a commit message for finalizing completion of one
 transaction, said server device comprising:

a receiving unit operable to receive a transaction identification flag that is sent, instead of the commit message, together with a second or later request message in successive transaction processes, the transaction identification flag being a
5 1-bit flag indicating whether a transaction process is in progress or completed in the terminal device; and

a judgment unit operable to judge whether or not completion of one transaction should be finalized based on the received transaction identification flag.

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15. The server device according to Claim 14,
wherein a value of the transaction identification flag is inverted every time a transaction is processed by the terminal device, and

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said server device further comprises

a holding unit operable to hold a first flag that is a copy of the transaction identification flag that is sent together with a preceding request message in the transaction processes,

wherein said judgment unit is operable to judge that
20 completion of a preceding transaction should be finalized in the case where the transaction identification flag in the current transaction process and the first flag held by said holding unit do not match, the transaction identification flag being received by said receiving unit.

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16. The server device according to Claim 15, comprising
a response sending unit operable to send, to the terminal device, an initial value of the first flag as an initial value of the transaction identification flag, together with a first response message in the transaction processes.

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17. The server device according to Claim 15,
wherein said receiving unit includes:

a request receiving unit operable to receive the transaction identification flag together with the second or later request message; and

5 a commit receiving unit operable to receive a commit message only in a last transaction process in the transaction processes.

18. The server device according to Claim 17,
wherein said response sending unit is operable to send a
10 response message for a next transaction process in the case where said judgment unit judges that the completion of the preceding transaction should be finalized.

19. The server device according to Claim 18,
15 wherein said response sending unit is operable to send again the response message for the preceding transaction process in the case where said judgment unit judges that the completion of the preceding transaction should not be finalized.

20. The server device according to Claim 15,
wherein said server device performs processing for mutual authentication with the terminal device immediately before a first transaction process in the transaction processes, and further comprises:

25 an authentication unit operable to:
verify first authentication information that is received by said receiving unit as an authentication request, the first authentication information being used by said server device to authenticate the terminal device; and

30 provide second authentication information that is used by the terminal device to authenticate said server device in the case where the first authentication information is verified as valid,

wherein said request receiving unit is operable to receive a finalization message for finalizing the mutual authentication together with the first request message.

5 21. The server device according to Claim 20,
 wherein the transaction processes are performed on a session
 that is same as a session on which the mutual authentication has
 been performed.

10 22. The server device according to Claim 21,
 wherein said receiving unit includes:
 a request receiving unit operable to receive the transaction
 identification flag together with the second or later request
 message; and
15 a commit receiving unit operable to receive a commit
 message only in a last transaction process in the transaction
 processes.

20 23. The server device according to Claim 22,
 wherein said response sending unit is operable to send a
 response message for a next transaction process in the case where
 said judgment unit judges that the completion of the preceding
 transaction should be finalized.

25 24. The server device according to Claim 23,
 wherein said response sending unit is operable to send again
 the response message for the preceding transaction process in the
 case where said judgment unit judges that the completion of the
 preceding transaction should not be finalized.

30 25. A digital content distribution system comprising a server
 device and a terminal device, said server device providing said

terminal device with a license for using a content based on transaction processes, each including receiving of a request message, sending of a response message, and receiving of a commit message for finalizing completion of a transaction, and said terminal
5 device controlling use of the content based on the license obtained from said server device,

wherein said terminal device comprises:

a holding unit operable to hold a 1-bit transaction identification flag indicating whether a current transaction process
10 is in progress or completed; and

a sending unit operable to send the transaction identification bit instead of a commit message when sending a second or later request message, without sending a commit message in each transaction process except for a last transaction process in
15 successive transaction processes, and

said server device comprises:

a receiving unit operable to receive the transaction identification flag that is sent together with the second or later request message in the successive transaction processes; and
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a judgment unit operable to judge whether or not completion of one transaction should be finalized based on the received transaction identification flag.

26. A transaction processing method for use in a terminal device
25 that obtains, from a server device, a license for using a content based on transaction processes and controls use of the content based on the license, each of the transaction processes including sending of a request message, receiving of a response message, and sending of a commit message for finalizing completion of one
30 transaction, said method comprising:

a control step of performing a control so that a 1-bit transaction identification bit is to be sent instead of a commit

message when a second or later request message is sent, without sending a commit message in each transaction process except for a last transaction process in successive transaction processes, the transaction identification bit indicating whether a current
5 transaction process is in progress or completed; and

a sending step of sending a commit message in the last transaction process.

27. A transaction processing method for use in a server device
10 that provides a terminal device with a license for using a content based on transaction processes, each including receiving of a request message, sending of a response message, and receiving of a commit message for finalizing completion of one transaction, said method comprising:

15 a step of receiving a transaction identification flag that is sent, instead of the commit message, together with a second or later request message in successive transaction processes, the transaction identification flag being a 1-bit flag indicating whether a transaction process is in progress or completed in the terminal
20 device; and

a judgment step of judging whether or not completion of one transaction should be finalized based on the received transaction identification flag.

25 28. A transaction processing method for use in a digital content distribution system comprising a server device and a terminal device, said server device providing the terminal device with a license for using a content based on transaction processes, each including receiving of a request message, sending of a response message, and
30 receiving of a commit message for finalizing completion of a transaction, and the terminal device controlling use of the content based on the license obtained from the server device, said method

comprising:

a control step, executed by the terminal device, of performing a control so that a 1-bit transaction identification bit is to be sent instead of a commit message when a second or later request message is sent, without sending a commit message in each transaction process except for a last transaction process in successive transaction processes, the transaction identification bit indicating whether a current transaction process is in progress or completed;

a sending step, executed by the terminal device, of sending a commit message in the last transaction process;

a receiving step, executed by the server device, of receiving the transaction identification flag that is sent, instead of the commit message, together with the second or later request message in the successive transaction processes, the transaction identification flag being a 1-bit flag indicating whether a transaction process is in progress or completed in the terminal device; and

a judgment step, executed by the server device, of judging whether or not completion of one transaction should be finalized based on the received transaction identification flag.

29. A program for causing transaction processes to be executed in a terminal device that obtains, from a server device, a license for using a content based on the transaction processes and controls use of the content based on the license, each of the transaction processes including sending of a request message, receiving of a response message, and sending of a commit message for finalizing completion of one transaction, said program causing a computer in the terminal device to function as:

a holding unit operable to hold a 1-bit transaction identification flag indicating whether a current transaction process is in progress or completed; and

a sending unit operable to send the transaction identification bit instead of a commit message when sending a second or later request message, without sending a commit message in each transaction process except for a last transaction process in successive transaction processes.

30. A program for causing transaction processes to be executed in a server device that provides a terminal device with a license for using a content based on transaction processes, each including receiving of a request message, sending of a response message, and receiving of a commit message for finalizing completion of one transaction, said program causing a computer in the server device to function as:

a receiving unit operable to receive a transaction identification flag that is sent, instead of the commit message, together with a second or later request message in successive transaction processes, the transaction identification flag being a 1-bit flag indicating whether a transaction process is in progress or completed in the terminal device; and

a judgment unit operable to judge whether or not completion of one transaction should be finalized based on the received transaction identification flag.